Appendix A1. ADEQ Summary of Energy Efficiency Activities in the State of Arizona (as of 2002)

From: *Regional Haze State Implementation Plan for the State of Arizona*, Air Quality Division Arizona Department of Environmental Quality, December 23, 2003
http://www.azdeq.gov/environ/air/haze/download/2sip.pdf

Table 12-3. Summary of Energy Efficiency Programs in Place in Arizona

Program Title	Program Description	2002 Status	Ref.
Arizona Energy Office, Arizona Dept of Commerce	The Energy Office's $2.3 million annual budget is funded through a combination of federal funds and Petroleum Violation Escrow funds. Director: Craig Marks (602) 771-1139 craigm@azcomerce.com http://www.azcommerce.com?energy/default.asp	The Energy Office's mission is to encourage energy efficiency and renewable-energy usage, provide energy education and community outreach, offer policy advise to the Executive and Legislative branches, and help Arizona low-income residents to reduce their utility bills and improve their comfort and safety.	3,4
Low Income Weatherization	The Energy Office administers Arizona's $3 annual million (federal and private funds), low-income, weatherization program. The primary mission of this program is to reduce the energy required for space heating and cooling for income eligible households applying for assistance through one of ten sub-grantees, statewide. This program receives its primary funding from the U.S. Department of Energy and the U.S. Department of Health and Human Services. The program also leverages additional funds through partnership with utilities,	17,000 homes weatherized to date. In 2002, 695 homes were weatherized statewide, with present- value utility savings of three million dollars. In addition to approximately $2.2 million in federal funds, the utilities provided the following: 2002 Utility Funding:	3

Program Title	Program Description	2002 Status	Ref.
	and other federal and state housing programs. Many aspects of the Residential Training and Technical Assistance Programs are now incorporated into the training of Weatherization sub-grantees, which assures that savings are maximized. The following are done under the program: • Adding thermal insulation to the residential building envelope, most typically attic insulation. Shading sun-exposed windows, primarily for houses using central refrigeration cooling. • Implementing air leak control measures to reduce excessive infiltration of outside air. • Testing, tuning and maintaining heating and cooling equipment. • Reducing duct leakage where heating and central refrigerated air is distributed by a forced air system. • Installing low-flow showerheads and other general energy and water efficiency measures. • Other energy conservation improvements as identified by the home energy auditor.	SW Gas $350,000 APS $302,397 TEP $180,000 Citizens $68,885 Co-ops $4,500 Total $905,782	
Special Project Grants	The Energy Office administers the State Energy Project – Special Project Grants. Each year states submit proposals in response to a DOE solicitation identifying how specific technologies could be implemented in their region of the country. DOE then selects the projects that best meet national energy goals. The Energy Office publicizes grant availability, helps prepare grant applications, and administers grants. The Energy Office is currently administering $2,865,375 SEP Special Project funds.	2002 Special Project Awards $800,000 to Pinnacle West for Hydrogen Power Park $75,000 to Tucson USD for Tucson Solar Schools $100,000 for Teaching Energy Conservation Supports Implementation of Energy Codes in Tucson Metro Area and Southern Arizona Communities $25,000 for Tucson Regional Clean Cities Coordinator $48,808 to AZ Energy Office to Film New Solar in Arizona Documentary $45,000 to Energy Office for State Industries of the Future Program Federal IOF – 9 Industries Targeted to Improve Energy Efficiency and Productivity, and to Manage Waste Streams AZ IOF Chapter Will Target 4 of the Federal IOFs – Agriculture, Aluminum, Forest Products, and Mining Goal – Establish Industry, Government, University Partnerships, With MOU Executed by 2004.	

Program Title	Program Description	2002 Status	Ref.
Residential-Market Training and Technical Transfer	Over 30,000 new homes are built each year in metro-Phoenix, making it one of the largest new home markets in the United States. Thousands more homes are built each year in other fast-growing Arizona communities. Improving the energy efficiency of new homes has an enormous impact on Arizona's energy usage. The Energy Office has long partnered with Arizona utilities to provided technical assistance and training for the building trades on the latest energy efficiency technologies and techniques, including: Infrared imaging to analyze insulation performance; Smoke generation to show duct leakage; and Using pressure diagnostics, such as the blower door testing, duct blasters, and digital monometers, to confirm envelope integrity. Overall the goal is to encourage builders and subcontractors to take a scientific systems approach to home construction and incorporate energy-efficient techniques into the building process.	Arizona's largest HVAC contractor now seals all ductwork, which has saved Arizonans over $27 million in energy bills since 1997. Over the past year, in partnership with the home-building industry and Arizona utilities, the Arizona Energy Office provided 23 days of training to over 2,500 attendees from the building-trades industry. Because of the innovations and techniques brought to the market, builders have helped develop and introduce Energy Star-certified homes into the Arizona market. Energy Star is a joint program offered by the U. S. Environmental Protection Agency and the U. S. Department of Energy. Energy Star certification requires a home to be 30% more efficient than the 1995 Model Energy Code, which saves the average homebuyer approximately $400 a year. Of the 34,000 Energy Star homes built nationally in 2001, over 8,000 were built in Arizona. Arizona homebuilders are also national leaders in offering guaranteed heating and cooling costs. These homes are typically 40% to 50% more efficient than required by the 1995 Code, and have guaranteed annual heating and cooling costs of approximately $ .30 per square foot. Regional and national homebuilders now market entire subdivisions where each home comes with guaranteed energy bills.	
Municipal Energy Management Program	The MEMP (Municipal Energy Management Program) encourages and assists in the development and implementation of energy management programs by facilitating the planning process and providing the necessary basic tools, staff training and technical assistance. As part of MEMP, the Energy Office makes funds available for energy saving projects. Those eligible to apply include incorporated Arizona cities, towns, counties, improvement districts, and Indian tribes with populations under 70,000. The MEMP approach to energy conservation is a simple and direct step-by-step approach. The first step is to understand where energy is being consumed and how much it costs, based on the utility bill analysis and audits. The second step identifies strategies for lowering energy costs. The third step assists in incorporating energy management into future development through an energy management plan.	$150,000 awarded to Arizona communities in 2002	

Program Title	Program Description	2002 Status	Ref.
Federal Energy Management Program	Goal: reduce the cost and environmental impact of the federal government by advancing energy efficiency and water conservation, promoting the use of distributed and renewable energy, and improving utility management decisions at federal sites. Funds are occasionally available to the Arizona Energy Office to partner with Indian communities and military bases or other federally-owned facilities	Ak Chin Community. This outreach was funded by thee Western Area Power Administration and FEMP. The Energy Office performed the following services for the Community: Residential Energy Audits Weatherization Training	
Market Design Initiatives	Salt River Project's M-Power is a residential prepayment program, which uses a special electric meter located outside the home, a small display unit located inside the home and smart cards, which work in a way similar to prepaid telephone calling cards. The SRP M-Power display shows how much energy is used daily and hourly, and when to buy more energy via the smart cards. With actual information on cost of consumption, customers conserve and can save as much as 10% on electric bills. At the same time, SRP reduces turn-off and turn-on costs, while improving customer satisfaction.		
Regulated Utility Customer Funding or System Benefit Charge Funding for Energy Efficiency	Tucson Electric Power: 2002 --$3 million in approved SBC spending, of which $2 million was for renewable energy programs and $1 million for low income and energy efficiency programs. Arizona Public Service: 2002 - $7 million in approved spending, of which $6 million was used for renewable energy programs and technology development, and $1 million for low-income customer support and other programs. In addition, under the EPS program, APS collected an additional $6,571,745 for renewable energy programs in 2002. See also the listing in Table 12-2 under the heading Regulated Utility Customer Funding or System Benefit Charge Funding for Renewable Energy.		
Residential New Construction and New Home Guarantee Programs	To help promote the value of energy efficient residential construction, APS works with builders and building material vendors to provide buyers with a heating and cooling guarantee. All participating builders must offer their homebuyers a 2-year guarantee that the monthly costs to heat and cool their home will be less than a specified amount. APS has promoted the concept of guaranteed heating and cooling bills through a multi-media campaign including TV, print, on-line, and point-of-sale materials. In 1997, TEP designed and implemented the first utility operated new home guarantee program in the nation. The program philosophy addresses the	Currently four of the top ten production builders in the Phoenix metro area are participating in the program and over 3500 home lots have been committed. Since inception to December 2002, there were 5590 homes either completed, in some progress of completion or waiting for	

Program Title	Program Description	2002 Status	Ref.
	issues of affordability, durability, comfort, health and safety using scientific laws of airflow, moisture-flow and pressure management within a home. Homes are constructed to high standards set by TEP and include on-site inspections of framing areas related to energy performance, insulation installation, and HVAC system design and installation. On-site testing is also provided to measure duct leakage, whole-house infiltration and pressure management within the home under various operating conditions. If a home passes all inspection and testing criteria, the homeowner receives a guarantee from TEP that heating and cooling costs will not exceed a predetermined average cost per day (calculated on each separate model home) and a guarantee for comfort for a pre-set time period. Homes permitted prior to February 20, 2003 receive a 3-year guarantee and homes permitted after February 20, 2003 receive a 5-year guarantee. Homeowners who purchase a TEP Guarantee home qualify for a specially designed rate-tariff that reduces the cost of all electricity used in the home by 12% annually compared to the standard residential electric rate. The homeowners also have the option to increase this electric rate savings to either 18% or 22% depending on their selection of TOU and/or the installation of solar water heating systems.	construction to begin. The program is operated within the utility structure with quality control provisions and the guarantee provided by a utility. All TEP Guarantee Homes qualify for ENERGY STAR since the qualifications from TEP are more stringent than ENERGY STAR. TEP provides the DOE/EPA program documents to customers along with the Guarantee certification.	
New Construction Energy Efficiency Research and Training	In partnership with the Arizona Energy Office, APS has conducted extensive research and testing on new residential construction with blower doors, duct blasters, infrared cameras, and other diagnostic tools. The result of these tests is a list of building construction details that need the most focus to improve home performance. In 1998, APS and the Arizona Energy Office began offering Building Science training for residential builders. TEP hosts quarterly education programs to target audiences of builders, sub-contractors, and city/county code officials, architects and consumers. These programs are designed to educate all audiences on the scientific approach of building new homes or retrofitting existing homes to gain the maximum benefit in affordability, durability, comfort and health and safety. TEP also adds matching funds for grants provided to the City of Tucson 'Teaching Energy Conservation' project which educates consumers, builders, contractors, consumers and code officials on various conservation related issues. The SRP-Certified Home (SCH) program was introduced in May 1995. For a subdivision to be	In 1998, APS and the Arizona Energy Office began offering Building Science training for residential builders. To date, over 2000 building industry members have attended. Coupled with the heating/cooling guarantee program, this has resulted in substantial improvements in the real world performance of residential new construction as confirmed through field studies by the Arizona Energy Office. Between 1999 and 2002, approximately	

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	SRP certified, SRP works directly with the builder to ensure that each home design meets our energy-efficiency standards. SRP certification means the home design includes certain energy-efficient features. Certification is based on the SRP-Certified Homes Point Sheet that primarily is a construction specification trade-off system. With the system, one design feature may be substituted for another if the overall design complies with the SRP-Certified Home energy consumption standard. Between 1999 and 2002, approximately 21,000 SCH contracts were signed. In 2002 SRP announced a new addition to the SRP-Certified Home program. Energy Code Compliance certification is now available upon request. SRP can provide REM/Design compliance reports for 1998/2000 International Energy Conservation Codes (IECC), CABO Model Energy Code (MEC), and ASHRAE 90.2 By adding the new "Code Compliance" feature to the program we can now assist builders in meeting the energy efficiency codes required by the various municipalities.	21,000 SCH contracts were signed.	
Qualified Contractor Program	APS offers referrals to customers seeking qualified, professional HVAC contractors for service or replacement of their existing AC/heat pumps. To qualify for the program, residential HVAC contractors are required to meet stringent requirements and complete ongoing rigorous APS education courses for their service technicians.	To date, APS has subsidized technical training for over 6000 service technicians. APS currently provides free contractor referrals to approximately 4000 customers each year, ensuring that units are properly serviced and installed.	
High Efficiency Appliance Programs	APS High Efficiency Air Conditioners Program For several years APS has worked with the air conditioner contractor community. This partnership has been instrumental in moving the market for resale air conditioners and heat pumps to high efficiency equipment. Evidence suggests that the resale market is about 90% 12 SEER, which is 15% more efficient than standard equipment, reducing demand and energy consumption. SRP Rebates on Highly-Efficient Refrigerators and Heat Pumps – Over the last several years, SRP has independently offered customers rebates on highly efficient refrigerators and heat pumps.	Since 1998, APS and contractors have distributed over 20,000 copies of the Consumer's Guide to an Energy Efficient Air Conditioning System as an education tool for customers. SRP has issued more than 8,500 rebates on refrigerators labeled by ENERGY STAR® as exceeding federal standards and more than 1,000 rebates on heat-pumps with a 13-SEER rating that also meet additional strict criteria.	
Time of use rates	APS Time of use rates - Approximately 40% of all residential customers are on a time of use rate. It is one of the highest penetrations of TOU rates in the country. APS is one of the only utilities nationwide to offer a demand rate for residential customers. Most new APS customers apply for one of the two		

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	TOU rates. Evidence suggests it reduces demand and shifts load. A recent survey of customers indicates that over 75% of TOU customers do shift some of their energy use to off-peak time periods. Customers feel it gives them control over their electric bill and helps conserve peak energy. SRP has approximately 140,000 customers on our peak-load shifting program, Time-of-Use (TOU). Residential TOU customers average 75% off-peak usage annually, while non-TOU residential customers average 72% - 73% off-peak usage annually. The result of TOU is that SRP has been successful in shifting 2%-3% of our average annual energy consumption to off-peak.		
Peak Reduction Campaign	Commercial Peak Reduction Campaign -- Since the summer of 2001, APS has promoted a voluntary summer peak energy management initiative with commercial customers. Participating customers pledge to save energy on extreme summer days when temperatures exceed 110 degrees in Phoenix. Customers receive an email on "Peak Power Days" asking them to turn thermostats up two degrees, turn off unnecessary lights and equipment, and adjust the schedule of energy-intensive processes. The campaign has helped shave peak consumption and heightened awareness of the need to save energy on extreme summer days.		
Shade Trees Campaign	The TEP Trees Program promotes energy conservation and the environmental benefits associated with planting low-water usage trees and other vegetation. Desert-adapted trees have been provided to residential neighborhoods, low-income families, public areas and schools by TEP. The residential trees are to be located on the south, west and east sides of homes in the TEP service area with the objective of continuing positive community service as well as providing Demand-Side Management ("DSM") benefits. Residential Program: There were 3,000 trees distributed to roughly 1,500 homes for the period January 1, 2002 through December 31, 2002. School and Community Programs: For the period January 1, 2002 through December 31, 2002, this program provided 105 fifteen-gallon-sized and 41 five-gallon-sized trees to 43 schools. In addition, 63 community projects received 115 fifteen-gallon-sized and 111 five-gallon-sized trees.		

Program Title	Program Description	2002 Status	Ref.
Energy Efficiency Education	APS provides a free on line energy analysis on aps.com. It allows customers and prospective customers to analyze their home and business energy use and identify customized energy efficient measures. APS provides seasonal energy savings tips online and in customer bill inserts. SRP Energy Savings Solutions Campaign Energy Savings Solutions (ESS) is a multi-media campaign, which runs from May through September. The goal of ESS is to educate customers about effective energy management. ESS provides customers with useful and easy ways to lower their energy usage and enables customers to make informed decisions everyday by demonstrating how home energy conservation efforts can help reduce energy costs. TEP provides free class sets of booklets to schools in its area, including, "Learning to Save Energy", which is geared to grades 3-5. TEP also offers teacher training and back up materials for two hands-on activities: The Insulation Station (which deals with residential energy issues) and The Energy Patrol (where a class or group of students learn about energy efficiency, and then try to "patrol" their school, helping remind others how to save energy). TEP also provides seasonal energy tips on-line and in mailings to customers and handouts at presentations.		
Energy Star	Customer Education on Purchasing Decisions SRP has been an ENERGY STAR® partner since 1999. This DOE/EPA program establishes stricter efficiency criteria for new products. As a partner, SRP has been able to not only increase awareness of ENERGY STAR, but also to provide information for customers so that they can make informed purchase decisions. This information has been incorporated into our monthly newsletters and our Energy Savings Solutions campaign and has also been heavily featured in on-going publications to both residential and commercial customers via *Powerful Solutions* and *eNews*.		
Energy Efficiency Audits	For approximately the last two years, SRP has been working with third party contractors and other entities such as the Arizona Department of Commerce to provide free or low cost energy efficiency audits and educational programs to energy consumers in the commercial, industrial and government sectors. The focus of the programs to date has been on high-efficiency lighting retrofits, energy information services, and improvements to compressed air systems.		

Program Title	Program Description	2002 Status	Ref.
	TEP offers the Energy Advisor, a quick, free, online analysis of a home's or business's monthly energy use, as well as suggestions on how to reduce energy costs.		
State Energy Efficiency Demonstration Program	Working with the Department of Administration and agency facility managers, the Energy Office provides training, technical assistance and funding to implement energy savings and demand-reduction measures in state-controlled facilities. Matching grant program.	Ongoing.	
State Facility Managers Training Program	Based on results of the forensic audits and utility tracking, the Energy Office provides training and technical assistance to state facility management staff with the goal of identifying actions that may be taken to decrease electricity consumption in state facilities. This training will assist facility managers in performing diagnostics on their facilities, complete retrofits on equipment and buildings, and track energy consumption.	Ongoing.	
Energy Efficient Schools	Energy Office partnership with School Facilities Board. A jointly funded engineer works with architects and vendors to incorporate cost-effective, energy-efficient designs and equipment. Energy audits of existing facilities are also available.	Significant opportunities have been found in replacement of HVAC package units, lighting retrofits, and central heating and cooling systems, for a total avoided energy costs of $8,916,197 per year.	
State Energy Code	HB 2541 (2001) Is a voluntary model energy code (AZ=home rule). This bill designates the State Energy Code as a legislative tool to create incentives for the use of energy saving devices and practices. It established a State Energy Code Advisory Commission to review and recommend changes to the State Energy Code. http://www.azleg.state.az.us/legtext/44leg/2r/bills/hb2451p/pdf	Energy Code Advisory Commission. Code Advisory Commission members were appointed. First meetings held by the Energy Office to provide technical support to Arizona municipalities In 2001, the Energy Office applied for and received a $100,000 grant from the U. S. Department of Energy to build on the legislative initiative and to initiate an outreach and training program for municipalities, governmental entities, code officials, and the building industry on codes and the impact on Arizona's energy consumption. In 2002, Energy Office efforts on codes are being concentrated in the areas of 1) codes adoption, and 2) training provided to the building industry designed to help insure that structures designed to code will also perform as designed.	1
Governor's Awards for Energy Efficiency	The Energy Office recognizes local governments, state agencies, and educational institutions for exceptional energy-conservation accomplishments.	The 2002 Governor's Awards for Energy Efficiency were presented to Arizona cities, educational institutions and state government agencies in recognition of successful energy conservation programs. Awards of Excellence, the highest honor, went to the City of Bullhead City, Arizona School Facilities Board, Mesa Unified School District and the Tucson Unified School District.	

Program Title	Program Description	2002 Status	Ref.
		The City of Tucson received Awards of Merit for two energy-saving projects. Awards of Merit were also given to the City of Coolidge, Arizona Department of Administration, Arizona Department of Public Safety and the Arizona Department of Game and Fish. The Arizona Department of Emergency and Military Affairs received Awards of Merit for two energy-conservation projects. In addition, Awards of Special Recognition were bestowed on the City of Tucson, Arizona Department of Administration, Arizona Department of Emergency and Military Affairs, Isaac Elementary School District and the Scottsdale Unified School District. The City of Mesa and the City of Phoenix both received Awards of Special Recognition for two energy-saving projects. http://www.azcommerce.com/Energy/eaward.htm	
Rebuild America	U.S. D.O.E. Program supported by Arizona Energy Office. - Helps businesses and communities reduce energy use in buildings.	Ongoing. Energy-efficiency seminar presented to Arizona school officials in September 2002.	1
Green Buildings	Green buildings are use design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment The concept includes: - Sustainable site planning - Safeguarding water and water efficiency - Energy efficiency and renewable energy - Conservation of materials and resources - Indoor environmental quality	City of Scottsdale Green Building Program. This is weighted rating checklist that emphasizes a system's approach by requiring 26 prerequisites. Established in 1998, 47 builders, 129 homes constructed by 2002. http://www.ci.scottsdale.az.us/greenbuilding/ Southern Arizona Green Building Alliance (in progress) This green building program is in its infancy and details are still being determined Contact Loretta Ishida, The Development Center of Appropriate Technology (520) 624-6628 Loretta@dcat.net, http://www.dcat.net	2
Leadership in Energy & Environmental Design (LEED)	This program facilitates positive results for the environment, occupant health and financial return. It defines "green" by providing a standard for measurement, prevents false or exaggerated claims, and promotes whole-building, and integrated design process. LEEDS evaluated and recognizes performance in accepted green design categories, existing and proven technologies. There are four levels of certification.	April Green Building Forum – sponsored by Phoenix, Scottsdale and Surprise. New capital mall buildings including Arizona Department of Environmental Quality and Department of Administration buildings built in 2002.	1
Utility Tracking	Developed by the Energy Office for entities with multiple accounts (e.g., schools, municipalities, large businesses). Uses Microsoft Excel to track utility usage by meter. Captures data from utility's web site. The program identifies problems, and raises questions.	Ongoing.	1

Program Title	Program Description	2002 Status	Ref.
National Industries of the Future	Administered by Department of Energy – Office of Industrial Technologies 9 Industries targeted that together supply 90% of the materials vital to US economy. The 9 industries are: agriculture, aluminum, chemicals, forest products, glass, metal casting, mining, petroleum, and steel. Goal: Promote energy efficiency and manage waste streams.	Arizona Industries of the Future being developed by Energy Office with D.O.E grant. 4 industries targeted - Agriculture - Aluminum - Forest Products - Mining	1
Industrial Assessment Centers	Administered by DOE, OIT Enables eligible small and medium-sized manufacturers to have comprehensive industrial assessments performed at no cost to the manufacturers. Teams of engineering faculty and students from the center, located at 26 universities around the country, conduct energy audits, or industrial assessment and provide recommendations to manufacturers to help them identify opportunities to improve productivity, reduce waste, and save energy.	Recommendations from industrial assessments have averaged about $55,000 in potential annual savings for each manufacturer ASU operates one of the 28 National Centers Director: Dr. Patrick E. Phelan (480) 965-1625 phelan@asu.edu	1
Income Subtraction for Construction of an Energy Efficient Residence	For taxable years beginning from and after December 31, 2001, through December 31, 2010, Arizona law (A.R.S. 43-1031) allows a subtraction for a residence that is 50% more efficient than the 1995 Model Energy Code (MEC). The subtraction is allowed for selling one or more new energy efficient residences located in Arizona. The subtraction is equal to 5% of the sales price excluding commissions, taxes, interest, points, and other brokerage, finance and escrow charges. The subtraction cannot exceed $5,000 for each new qualifying residence. A home's energy efficiency must be demonstrated by a score of at least 90 points (indicating that the home is 50% better than the MEC threshold) on a home energy rating. A Certified Home Energy Rater must provide the home energy rating.	Ongoing	4
Building America	Building America is a private/public partnership that provides energy solutions for production housing. The Energy Office assists in disseminating the results of this effort to the Arizona market place.	Ongoing	4
Governor's Smart Energy Usage Program	"Conservation saves money, which makes sense during tight budget times. And decreased energy production saves water, which makes sense during a drought. These two reasons provide more-than-enough motivation to conserve this summer," Arizona Governor Jane Dee Hull said when announcing the Smart Energy: Phase II program for summer 2002. As a result of the success of the 2001 campaign, Governor Hull ordered all agencies under her	The Smart Energy campaigns of 2001 and 2002 require state agencies to set thermostats up two degrees to save energy. As a result it is estimated that these conservation efforts reduced energy usage from 7 to 10 percent and saved the state $115,000 in utility bills during the summer of 2001 The campaign also called upon Arizonans to do their part. "Two Degrees - No Sweat" encouraged Arizonans to save energy by raising thermostats two degrees.	4

Program Title	Program Description	2002 Status	Ref.
	jurisdiction to take a number of energy-saving steps for the second summer in a row. The Governor also asked that state residents voluntarily comply with the "Arizona Smart Energy: Phase II" program. As part of the Smart Energy: Phase II program, the Governor asked all state employees to implement the following energy saving measures: • Every agency will use power management tools like Energy Star to keep computers, monitors and other devices in stand-by mode when not in use. • Employees will turn off lights and office equipment, as much as possible, when they expect to be out of the office for more than one hour. • Agencies will reduce all lighting that does not affect productivity, health or safety. • Thermostats in all state-controlled facilities, will be increased during the months of June through September by two degrees or brought within the 76-79 degrees F range, whichever is greater. • Agencies will implement a professional, casual-dress policy from June through September, consistent with the type of work being performed.		

1 Presentation by Craig Marks, of the Arizona Energy Office, Department of Commerce, to the Pollution Prevention Workgroup, July 26, 2002.
2 "Summary of Green Building Programs," Prepared for National Renewable Energy Laboratory, by National Association of Home Builders Research Center, Second Edition, August 2002.
3 U.S Department of Energy, Office of Building, Technology, State & Community Projects, http://www.eere.energy.gov/buildings/state_energy/
4 Arizona Department of Commerce, Energy Office, http://www.azcommerce.com/Energy/default.asp

Appendix A2. Information on Energy Efficiency Programs from the Southwest Energy Efficiency Project

All information compiled by SWEEP and available at their website, http://www.swenergy.org/programs/arizona/index.html

I. Utility Programs

Arizona's utilities are carrying out relatively limited energy efficiency programs, mainly linked to promoting particular energy sources for space heating.

Arizona Public Service

Arizona Public Service's Performance Built Homes program provides marketing and financial assistance to builders that guarantee a home's annual heating and cooling bills will not exceed a certain maximum level. All homes must first exceed the minimum requirements for the EPA Energy Star Home program. Then, for those builder's guaranteeing heating and cooling bills under a product manufacturer's program (such as the Certified Plus, Engineered for Life, or Environments for Living programs), APS will pay 50% of the builder's inspection costs (which can range from $50 to $250 depending on the program requirements) associated with the obtaining the manufacturer's guarantee.

Fifteen production and custom homebuilders in the metropolitan Phoenix area offer the guarantee. The program also offers educational materials and training to homeowners, subcontractors and builders, consumer education. Contact the program for more information.

Tucson Electric Power

Tucson Electric Power (TEP) initiated a voluntary new home program in 1997 that guarantees heating and cooling costs and comfort for three years. The utility bill guarantee is based on typical kilowatt hour (kWh) usage for the individual homes. If the annual cost exceeds the specified cost, TEP will refund the difference to the homeowner. Guarantee Program homes exceed the EPA Energy Star efficiency requirements and automatically receive Energy Star designation.

The program does not specify prescriptive requirements for insulation in walls and attics or window and air conditioning efficiencies, but instead addresses energy use on a square footage basis. Homes include a tightly-sealed duct system (the system cannot leak more than 3%) that must be sealed with mastic and include return air passages and fresh-air ventilation systems. Homes must be equipped with electric heat pumps and electric water heaters but can use natural gas for fireplaces, stoves, clothes dryers, and pool heaters.

Homeowners participating in the Guarantee Program automatically receive a 12% electric rate reduction. Those who select the time-of-use rate get an 18% rate reduction and homes with solar hot water heating can receive up to 22% off regular electric rates.

More than 45 custom and 55 production builders participate in TEP's Guarantee Program. In 2001, Guarantee Program homes represented 22% of the new construction market in TEP's service territory. Visit TEP's Home Page for more information. See Tucson, Arizona Utilities' Efficiency Programs for New Homes, a SWEEP Program Profile.

TEP working with the Trees for Tucson program offers residents up to two five gallon-size trees at $3.00 per tree for planting on the west, east or south side of their homes. Tree planting provides shading and evapotranspiration, thereby reducing cooling load and air conditioning operation. The program has distributed more than 22,000 trees since it started in 1993. The program also provides information to homeowners, neighborhood groups, and schools on low-water species appropriate to the local environment, and optimum placement of trees for energy and water conservation. While TEP does not associate any kWh savings to the program, the City of Tucson estimates that each tree will save about 300 kWh annually once the trees have matured.

Salt River Project

The Certified Homes program recognizes energy efficient subdivisions in metropolitan Phoenix that meet specific electrical energy efficiency requirements. All of the homes are required to have high efficiency electric heat pumps and annual energy consumption must not exceed a maximum standard (based on kWh/square foot) as determined by SRP's Cost Analysis Program. Certification is determined by a point system of component trade-offs. Four to six thousand homes are built each year under the program, which has been in place since the early 1990's.

Small to medium-sized businesses (those under 20,000 square feet) whose peak summer demand is less than 100 kilowatts can receive on on-site energy audit and computer analysis of cost-effective energy efficiency measure for $150 through SRP's Energy Advisor program. Commercial consumers can also receive a free on-site analysis of their lighting system with SRP's Lighting Solutions program which provides recommendations and associated costs for lighting improvements. Businesses also can work with SRP contractors for the purchase and installation of energy efficient fixtures, ballasts, lamp fixtures, lamps and controls.

Southwest Gas

The Southwest Gas Energy Advantage Plus new home construction program is an opportunity for Tucson area builders to get recognition for various categories of energy efficient homes. The first category requires only an energy analysis of plans to show that the home will be 15% more efficient than MEC 95. The next category requires homes to be 15%-30% more efficient than MEC 95 and requires performance testing of the home when completed.

Homes that achieve Energy Star designation (30% or more efficient than MEC 95) fall into the third category. The last category of homes are those that are built under programs that guarantee annual utility costs by participating in programs such as Certified Plus, Engineered for Life, or Environments for Living.

The utility also administers an Energy Advantage home program in its Phoenix service territory, but its only focus is to encourage builders to construct gas-fueled homes rather than all-electric homes.

All of the utilities in Arizona provide energy-saving tips for their residential and commercial consumers and/or on-line energy audits. The latter provide an overview of home energy use and help to identify specific energy efficiency improvements.

II. State Policies and Programs

Arizona Department of Commerce

The Arizona Department of Commerce's Energy Office provides energy efficiency programs for businesses, communities and homeowners in Arizona.

Rebuild Arizona offers commercial building and multi-family housing owners and managers information and technical assistance for energy efficiency improvements to existing buildings. The program strives to reduce energy consumption by 25%. Arizona State University and Arizona Public Service Company are active partners in the program and a variety of other public and private entities and utilities are key members. Established in 1998, the program has assisted with a large number of audits and large-scale lighting replacement projects with Northern Arizona University, Arizona State University and the University of Arizona. Program officials report that several energy savings performance contracts are underway in the public and private sectors. The program is currently splitting the costs of an energy engineer with the School Facilities Board to perform plan reviews for new buildings and energy efficiency improvements to existing buildings. For more information about Rebuild Arizona, view its brochure and details on the Rebuild America website

The Energy Office's Municipal Energy Management Program encourages the development and utilization of energy management plans in municipalities with populations under 70,000 and offers a limited number of $10,000 matching grants for energy efficiency projects. Six to nine municipalities work with the program each year to identify improvements based on life-cycle cost calculations. Typical energy efficiency improvements are more efficient pumps for water and wastewater treatment, LED traffic light installations, and lighting retrofits in public buildings.

The weatherization program for low-income homeowners helps individuals and families who qualify to lower their utility bills by adding thermal insulation to the residential building envelope, reducing air leakage, tuning up heating and cooling equipment, among other things. Since the program began in 1977, more than 25,000 homes have been weatherized.

Energy Efficiency in State Buildings

A May 2001 Executive Order directed state agencies and employees to implement energy conservation measures in state facilities. Their efforts reduced energy costs $130,000 for the state and taxpayers during the summer of 2001 alone. State agencies and employees are

instructed to take steps to lower the state's energy usage during summer peak electricity use, including:

- Turning off office lights and all office equipment when not in use for more than one hour.
- Using Energy Star or other computer terminal power management tools that put the computers and monitors in "stand-by mode" when not in use.
- Raising thermostats two degrees from June – September in all state facilities

State income tax deduction for energy-efficient new homes

Effective in January 2002, Arizona home sellers can subtract five percent (up to $5,000) of the sales price of a single family home or condominium that is 50% more efficient than the 1995 Model Energy Code (MEC) from their income for the purpose of calculating their state income tax. The income tax deduction is available through 2010.

A home's energy efficiency must be demonstrated by a score of at least 90 points (indicating that the home is 50% better than the MEC threshold) on a home energy rating. The Department of Commerce's Energy Office will adjust the eligibility criteria if the number of residences that qualify is larger than 5% of the total number of residences sold.

Arizona Coalition for New Energy Technologies

The Arizona Coalition for New Energy Technologies is a business coalition that promotes its members' innovative technologies through outreach programs, policy advocacy and various other activities. The coalition works cooperatively with a broad range of industry organizations and stakeholder communities to advance clean and efficient energy technologies that enhance the region's environment and economy - and our national energy security.

III. Local Policies and Programs

Phoenix

Phoenix has been working on reducing energy use in city facilities for more than 20 years. After numerous low- and no-cost changes, the City established the Energy Conservation Savings Reinvestment Program. The City determines energy savings based on energy consumption before and after a retrofit in the first year and for the next ten years. Half of this amount goes into the Reinvestment Fund while the other half returns to the general fund. Through the Reinvestment Fund, the city expects to save $42 million in energy costs from 1978 to 2002. Click here for a summary of the financing mechanism.

Most of the more than 1,000 completed energy efficiency projects are standard efficiency measures, such as improved lighting, motors, and controls. However, the program helped finance a district cooling system and a thermal storage system for the new City Hall, as well as small-scale cogeneration, solar, and waste water systems. Phoenix also uses the fund for purchases of

high-efficiency equipment, research into new efficiency technologies, and training for facility maintenance staff.

The City has budgeted more than $7 million from 2001-2006 for energy conservation projects including lighting retrofits, facility energy management systems, and energy efficient equipment and motors in its water delivery and wastewater management facilities.

Scottsdale

Launched in 1998, the Scottsdale Green Building Program promotes energy- and resource-efficient home construction. The program includes thirty-six builders but only 120 homes have qualified so far.

IV. Building Energy Codes

The state of Arizona recently enacted legislation encouraging local governments to voluntarily adopt of the 2000 International Energy Code (IECC) and ASHRAE Standard 90.1-1999. However, as a home-rule state, Arizona municipalities are able to adopt and enforce their own residential and commercial building energy codes. The state does require that its own buildings comply with the ASHRAE Standard 90.1-1999, the most recent and model standard for energy efficiency in commercial buildings.

Phoenix has no minimum residential and commercial building energy code requirements but is incorporating energy efficiency measures into the design of municipal buildings. Phoenix, however, is a leading community with respect to the construction of Energy Star homes (see case studies section).

Neighboring Scottsdale also has no code but is considering adoption of the IECC in 2002. The southern metropolitan area of Tucson/Pima County has adopted the building energy codes found in the 1998 edition of the IECC.

The City of Tucson has implemented a Sustainable Energy Standard for city-owned and financed residential, multi-family and commercial buildings. The City builds, on average, approximately 50,000 square feet of new floor space and undertakes about 120 major renovation projects each year.

The standard is based on the code developed for the Community of Civano (see case study below), which is 50% more efficient than the 1995 Model Energy Code. Changes to the code for commercial buildings focus mainly on improved lighting efficiencies. Residential requirements include an air conditioner efficiency rating of SEER 12.0 or better, R-19 exterior walls, and HVAC systems are to be individually sized for each home.

Appendix A3. Description of Arizona RCI-related Renewable Energy Activities from the Database of State Incentives for Renewable Energy (2005 Status)

Source: http://www.dsireusa.org/library/includes/map.cfm?State=AZ&CurrentPageId=1
Updated as recently as February 2005

Financial Incentives

Qualifying Wood Stove Deduction

Last DSIRE Review: 08/26/2004

Incentive Type: Personal Deduction
Eligible Technologies: Wood Stoves
Applicable Sectors: Residential
Amount: Cost excluding taxes
Max. Limit: $500
Authority 1: ARS 43-1027
Effective Date: 12/31/93
Expiration Date: None

Summary:

This incentive allows Arizona taxpayers to deduct the cost of converting an existing wood fireplace to a qualifying wood stove. The cost may not exceed $500. Qualifying wood stoves must meet the standards of performance for new wood heaters manufactured after July 1990, or sold after July 1992. This deduction is for taxable years after December 31, 1993.

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Solar and Wind Energy Systems Credit

Last DSIRE Review: 08/25/2004

Incentive Type: Personal Tax Credit
Eligible Technologies: Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Wind, Solar Ovens, Solar Pool Heating, Daylighting
Applicable Sectors: Residential
Amount: 25%
Max. Limit: $1,000
Terms: $1,000 imaximum credit for residence regardless of number of energy devices installed; Credit should be taken in first year, but may be carried forward for 5 years
Website: http://www.revenue.state.az.us/brochure/543.pdf
Authority 1: A.R.S. § 43-1083
Effective Date: 1/1/95

Summary:

Arizona's Solar Energy Credit provides an individual taxpayer with a credit for installing a solar or wind energy device at the taxpayer's Arizona residence. The credit is allowed against the taxpayer's personal income tax in the amount of 25% of the cost of a solar or wind energy device, with a $1,000 maximum allowable limit, regardless of the number of energy devices installed. The credit should be claimed in the year of installation and if the amount of the credit exceeds a taxpayer's liability in a certain year, the unused portion of the credit may be carried forward for up to five years.

Qualifying technologies include solar domestic water heating systems, solar swimming pool and spa heating systems, solar photovoltaic systems, solar photovoltaic phones and street lights, passive solar building systems (trombe walls, thermal mass, etc), solar daylighting systems (excluding conventional skylights), wind generators, and wind powered pumps.

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Solar and Wind Equipment Sales Tax Exemption

Last DSIRE Review: 02/15/2005

Incentive Type: Sales Tax Exemption
Eligible Technologies: Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Wind, Solar Pool Heating, Daylighting
Applicable Sectors: Commercial, Residential, General Public/Consumer
Max. Limit: $5,000 per system for retailers; $5,000 per contract for contractors
Terms: Solar/wind retailer or contractor must register with the AZ Department of Revenue
Website: http://www.azsolarcenter.com/benefits/solarsalestax.html
Authority 1: A.R.S. § 42-5061
Effective Date: 1/1/97
Expiration Date: 1/1/2011
Authority 2: A.R.S. § 42-5075
Date Enacted: 2003
Expiration Date: 1/1/2011

Summary:

Arizona provides a sales tax exemption for the sale or installation of "solar energy devices". A solar energy retailer may exclude from tax up to $5,000 from the sale of each solar energy device, and a solar energy contractor may exclude up to $5,000 of income derived from a contract to provide and install a solar energy device. For contractors, the deduction cap of $5,000 applies to the contract, rather than each energy device. To take advantage of these exemptions, a retailer or contractor must register with the Arizona Department of Revenue (ADOR) filing Arizona Department of Revenue Form 6015 - Solar Energy Devices.

The statutory definition of "solar energy device" includes wind electric generators and wind-powered water pumps in addition to daylighting, passive solar heating, active solar space heating, solar water heating, and photovoltaics. The sales tax exemption does not apply to batteries, controls, etc., that are not part of the system.

According to the Arizona Solar Center's website, another provision of Arizona sales tax exemption may apply without value limit to the basic power generating part of the system (consisting of at least PV modules, structure, array wiring and controls; the limits have not been clearly defined). This further exemption requires the filling out of form ADOR 5000 titled "Transaction Privilege Tax Exemption Certificate" and checking reason #16, "Machinery, equipment or transmission lines used directly in producing or transmitting electrical power, but not including distribution."

Most cities have a 0.5 to 2% city privilege ("sales") tax that is applicable to sales or installations of solar energy devices, unless a city specifically exempts such sales under its city tax code. Solar energy retailers should check with the city in which the retail business is located to find out whether city privilege tax is applicable. Solar energy contractors should check with the city in which the installation will be performed to find out whether city privilege tax is applicable.

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SRP - SolarWise

Last DSIRE Review: 11/04/2004

Incentive Type: Utility Rebate Program
Eligible Technologies: Solar Water Heat, Photovoltaics
Applicable Sectors: Commercial, Residential, Construction
Rebate: $3,000/kW (PV); $750 (solar hot water system)
Website: http://www.srpnet.com/power/solar/solarwise.asp

Summary:

SRP introduced its new solar rebate program September 1, 2004. Incentives are available to participants purchasing photovoltaic systems or domestic solar water-heating technologies. For the SolarWise Energy PV system program, SRP offers $3/watt, or $3,000 for a 1-kW system, $6,000 for a 2-kW system and $9,000 for a 3-kW system. Although participants may install a system larger than 3-kW, $9,000 is the maximum payment amount for the SolarWise Energy PV program. For the SolarWise Energy water heating system program, SRP is offering a payment of $750.

In exchange for payment, the customer allows SRP to retain the green energy credits for the electricity produced. Systems must be installed by a licensed contractor. SRP will provide and install a required separate meter. Application forms and instructions are available at the program website.

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TEP - SunShare PV Buydown

Last DSIRE Review: 09/23/2004

Incentive Type: Utility Rebate Program
Eligible Technologies: Photovoltaics
Applicable Sectors: Commercial, Residential
Rebate: $2,000 per AC kW; $3,000 per DC kW
Distributions: 104 customers as of August 2004
Website: http://www.greenwatts.com/pages/sunshare.html

Summary:

Tucson Electric Power (TEP) created the SunShare hardware buy-down program to encourage residential and business customers to install new photovoltaic equipment. Under this program, photovoltaic systems of 1 kW to 10 kW are eligible. The customer may either purchase a system kit from TEP or they may purchase a qualifying system from a third party. The SunShare program kicked off in 2001, and was expanded in August of 2004.

The SunShare program can provide incentives of 200 kW of solar capacity per year. Customers have three SunShare Options to choose from. SunShare Option 1 and 3 require that you provide your own photovoltaic equipment while SunShare Option 2 requires that you purchase a solar equipment kit from TEP.

Under SunShare Option 1, TEP will provide a rebate of $2,000 per kW of verified AC output for photovoltaic systems purchased on your own.

Under SunShare Option 2, customers receive a $2,000 discount on a 1-kW AC output photovoltaic kit purchased from TEP. The kit includes panels, inverter, supports, meter, and meter socket.

Under SunShare Option 3, you purchase your own photovoltaic equipment and the rebate amount is based on the installed solar generating capacity, or DC capacity. With this option TEP will provide a rebate of up to $3,000 per kW of rated DC solar generating capacity. To receive the higher rebate, TEP must receive a completed SunShare agreement by the end of 2004 and the system must be operational within 180 days after receipt of the agreement (systems are reserved for 180 days until the 200 kW ceiling is reached in each year). The rebate amount will be reduced to $2,700 per kW of DC capacity in 2005 and up to $2,400 per kW of DC capacity in 2006.

To qualify for the buy down program, participants must: 1) be a customer of TEP; 2) have at least 260-sq. ft. of unobstructed space; 3) have a roof facing within + or - 22 degrees of true south (greater angles are accepted with a payback derating); 4) be within 100 ft. of where tying to the grid; and 5) have a roof that can accommodate panels at a 20-35 degree angle (other angles will be accepted with a payback derating). Installations must have been made after January 1, 1997. The PV equipment must meet TEP and Arizona Corporation Commission requirements for self-generation equipment. TEP provides maintenance for systems purchased under SunShare Options 1 and 2. Customers who take advantage of SunShare Option 3 must maintain their own photovoltaic systems. TEP will inspect all SunShare systems at least once a year to ensure they are functioning properly.

The program has received over 1000 inquiries and over 150 applications. As of August 2004, about 104 customers have received payback or are in the process of being tested for acceptance.

In addition to financial assistance from TEP, state tax benefits are available up to $1,000.

TEP also offers a net metering option which credits the customer with the energy sent into the grid on a kWh basis.

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UES - SunShare PV Buydown

Last DSIRE Review: 08/24/2004

Incentive Type: Utility Rebate Program
Eligible Technologies: Photovoltaics
Applicable Sectors: Commercial, Residential
Rebate: $3,000 per DC kW
Terms: 1 kW to 5 kW systems
Website: http://uesaz.com/electric/greenwatts/pages/sunshare.html

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Summary:

UniSource Energy Services (UES) offers the SunShare hardware buy-down program to encourage residential and business customers to install new photovoltaic equipment. Under this program, customers who purchase new photovoltaic systems of 1 to 5 kW are eligible for an incentive. UES began offering the SunShare program in August 2004.

The SunShare program can provide incentives of 50 kW of solar capacity per year. The incentive amount is based on the installed solar generating capacity, or DC capacity. UES will provide up to $3,000 per kW of rated DC solar generating capacity. To receive the incentive, UES must receive a completed SunShare agreement by the end of 2004 and the system must be operational within 180 days after receipt of the agreement. The incentive amount will be reduced to $2,700 per kW of DC capacity in 2005 and up to $2,400 per kW of DC capacity in 2006.

To qualify for the program, participants must: 1) be a customer of UES; 2) have at least 450-sq. ft. of unobstructed space; 3) have a roof facing true south; 4) be within 100 ft. of where tying to the grid; and 5) have a roof that can accommodate panels at a 32-degree angle. Installations must have been made after January 1, 1997. The PV equipment must meet UES and Arizona Corporation Commission requirements for self-generation equipment. UES will inspect all SunShare systems at least once a year to ensure they are functioning properly. A Photovoltaic Interconnection Application must be completed.

In addition to financial assistance from UES, state tax benefits are available up to $1,000.

Contact:

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Rules, Regulations & Policies

Maricopa Assn. Of Governments - PV and Solar Domestic Water Heating Permitting Standards

Last DSIRE Review: 03/02/2005

Incentive Type: Construction/Design Standard
Eligible Technologies: Solar Water Heat, Photovoltaics
Applicable Sectors: Commercial, Residential, Construction, Installer/Contractor
Sectors: Residential and Commercial PV systems / Residential Solar Domestic Water Heating Systems
Website: http://www.mag.maricopa.gov/pdf/cms.agendas/BCMay15attach_361.pdf
Authority 1: PV Permit Standards
Date Enacted: PV - 5/15/02; SDWH - 6/18/03
Authority 2: Solar Domestic Water Heating Permit Standards

Summary:

In an effort to promote uniformity, the Maricopa Association of Governments (MAG) approved standard procedures for securing necessary electrical/building permits for residential (single-family) and commercial PV systems. These procedures are a part of the MAG Building Code Standards. The standards address requirements for the solar installation, plans, diagrams, applicable warnings, and signage. The same standards were adopted by the City of Scottsdale, although many other cities in the Phoenix area are using them as well. The Arizona solar industry was also involved in the development of the procedures. The MAG is a Council of Governments that serves as the regional agency for the metropolitan Phoenix area.

On June 18, 2003, MAG passed permit submittal requirements for residential solar domestic water heating systems. This is in addition to the existing standards for residential and commercial PV systems. Local solar installers have reported that being able to refer permitting officials to these MAG standards has made it easier and quicker to get project permits.

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Scottsdale - Green Power Purchasing

Last DSIRE Review: 02/23/2005

Incentive Type: Green Power Purchasing/Aggregation
Eligible Technologies: Photovoltaics
Applicable Sectors: Local Government
% Renewables: 40,500 kWh/year
Website: http://www.scottsdaleaz.gov/Topic.asp?catID=5

Summary:

In 1997, the City of Scottsdale joined the Arizona Public Service (APS) Solar Partners Program. At that time, the available role for the City was to provide facilities or land where APS, at no charge to them and no cost to the City, could install solar power generating systems. The solar power generated from these systems is added to the power grid where it became available for Scottsdale residents who subscribe to the Solar Partners Program. The first system installed was an 8,000 square-foot, 34-kW PV roofing system on employee parking lot carports at the City's Via Linda Campus. The Civic Center Library and Mustang Library is each host to a 2-kW PV system. The Water Campus system is comprised of two 150-kW single access tracking systems mounted on water storage reservoirs. The Water Campus system is the largest system of its type in the United States and is the first solar installation on a reservoir.

APS expanded the Solar Partners Program to enable commercial enterprises and those partners whose facilities included APS solar power generating installations to purchase a portion of the solar power they generated. In June 2000, Scottsdale began an annual purchase of 40,500 kWh of solar energy for its Civic Center and Mustang Libraries. AS of February 2005, the city is currently finalizing an agreement with the local utility company for the installation of a 30 KW system at their new Senior Center. The construction for this project is just beginning.

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Solar Contractor Licensing

Last DSIRE Review: 05/05/2004

Incentive Type: Contractor Licensing
Eligible Technologies: Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics
Applicable Sectors: Installer/Contractor
Examination: Yes
Specific: Yes
Training: Yes
Credit Req: No
Website: http://www.rc.state.az.us/l_class.html
Authority 1: A.R.S. § 32-1170 et seq.
Expiration Date: None

Summary:

The Arizona Registrar of Contractors does not have any specific solar license, but considers this to fall under the C11/L11 general electrical license. There is a special solar only domestic hot water license. However, It is possible to get a special negotiated "SOLAR ELECTRIC INSTALLATIONS ONLY" license, C05, that has reduced technical testing (and all the normal general contracting law testing). Such a license allows installation of all of the PV system and connection to the nearest appropriate electrical panel. A minimal bond is required.

In some ways, the Solar Electric Installations Only license is better than a straight electrical license. For instance, one can subcontract required trades for an installation such as landscaping that technically speaking, an electrician can not do unless he/she also has a general contracting license

All contractor licenses in Arizona require four years experience, of which two years may be satisfied through technical training and passing an exam. The following licensing exams include sections on solar applications: Air Conditioning and Refrigeration; Boilers, Steamfitting and Process Piping; Swimming Pools; and General Plumbing. For each of these categories there is a commercial and residential license.

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Solar Design Standards for State Buildings

Last DSIRE Review: 04/07/2004

Incentive Type: State Construction Policy
Eligible Technologies: Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Daylighting
Applicable Sectors: Schools, Construction, State Government
Sectors: State Buildings, School Districts, Community Colleges, Universities
Requirement or Evaluation: Written evaluation of solar energy features
Authority 1: ARS 34-452
Date Enacted: 1997
Expiration Date: None

Summary:

Arizona law requires that new state building projects over six thousand square feet follow prescribed solar design standards and that solar improvements be evaluated on the basis of life cycle costing. Such new buildings include state office buildings, school districts, community college districts and universities. These projects must include evaluation of: (a) proper site orientation; (b) active and passive solar energy systems for space heating; (c) solar water heating; and (d) use of solar daylighting devices. The life cycle costing requirements state that solar energy and energy conservation design, equipment and materials shall be used if the simple payback in energy savings is eight years or less.

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Solar Energy Covenant Restrictions

Last DSIRE Review: 08/26/2004

Incentive Type: Solar Access Law/Guideline
Eligible Technologies: Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Solar Pool Heating, Daylighting
Applicable Sectors: Residential
Authority 1: A.R.S. § 33-439
Date Enacted: 1979
Expiration Date: None

Summary:

This state law, which was passed by the Arizona Legislature in 1979 in order to protect individual homeowners' private property rights to use solar, dissolves any local covenant, restriction, or condition attached to a property deed that restricts the use of solar energy.

This law was challenged in the courts in the spring of 2000. A Maricopa County Superior Court judge ruled in favor of homeowners in a lawsuit filed by their homeowners association seeking to force the homeowners to take down solar panels installed on the roof. After a four-day trial, the Judge found that the association's "guidelines combined with [its] conduct "effectively prohibited" the defendants from placing solar heating devices on their residence, contrary to the provisions of A.R.S.-33-439 (A)."

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Solar Equipment Certification

Last DSIRE Review: 02/25/2004

Incentive Type: Equipment Certification
Eligible Technologies: Solar Water Heat, Photovoltaics, Wind, Daylighting
Applicable Sectors: Commercial, Industrial, Residential, Construction, Installer/Contractor
Website: http://www.azsolarcenter.com/benefits/guidelines1.html
Authority 1: A.R.S. § 44-1761 et seq.
Date Enacted: 1995
Expiration Date: None

Summary:

Collectors, heat exchangers and storage units of solar-energy systems sold or installed in Arizona -- and the installation of these components -- must have a warranty of at least two years. The remaining components of the system and their installation must have a warranty of at least one year. Solar-energy systems are subject to random inspections by the registrar of contractors.

With the exception of solar-energy systems designed or installed by the final owner, systems sold or installed in Arizona must be installed by licensed solar contractors and must comply with any consumer protection, rating, certification, performance, marking, installation and safety standards adopted by the Arizona Department of Commerce. (Solar-energy systems designed or installed by the final owner are exempt from these requirements.)

Furthermore, the installation of a solar-energy system must meet the requirements of all applicable fire, safety and building codes; consumer protection standards, including freeze protection and temperature related damage standards adopted by the Arizona Department of Commerce; and all other applicable federal, state and local laws.

The Arizona Solar Center's web site provides extensive guidelines describing the types of solar devices and systems that are subject to state certification, ratings and other standards.

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Tucson - Sustainable Energy Standard

Last DSIRE Review: 03/02/2005

Incentive Type: Construction/Design Standard
Eligible Technologies: Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics
Applicable Sectors: Commercial, Local Government, Construction
Sectors: Residential, commercial
Req. or Eval: Requirement
Website: http://www.tucsonmec.org/
Authority 1: Metropolitan Energy Commission's Sustainable Energy Standard
Effective Date: 4/22/1998

Summary:

The Tucson-Pima County Metropolitan Energy Commission (MEC) is an appointed, all-volunteer civic commission, jointly established in 1980 by the City of Tucson and Pima County to serve the community on energy matters. In mid-1994, MEC initiated Sustainable Tucson Initiatives. MEC has supported and promoted Sustainable Tucson Initiatives through seed grants and partnerships with other organizations to meet the needs of the wider community for more sustainable approaches to development and quality of life.

MEC developed the Sustainable Energy Standard through the local energy code committee. Originally designed to be the minimum energy performance requirement for Civano, the City of Tucson recently adopted it for all new municipal construction. This aggressive standard requires reducing energy consumption by 50% over the 1995 Model Energy Code. The building code initiatives were achieved through community-wide support to create new market opportunities which would reduce the negative environmental impacts of construction.

Resource efficiency is an important component of all Sustainable Tucson Initiatives. Natural resource conservation is being achieved in various ways. The prototype Civano project will reduce energy consumption by at least 50% over conventional building code requirements, potable water use by 30%, landscaping water use by 70%, and solid waste disposal by 50% . Civano will also reduce carbon dioxide emissions by an estimated 21,000 tons per household.

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